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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/673,202	12/04/2000	Shigehiro Shimada	KOIK-T0215	2182

7590 08/22/2005

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EXAMINER	
CASCHERA, ANTONIO A	

ART UNIT	PAPER NUMBER
2676	

DATE MAILED: 08/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/673,202	SHIMADA ET AL.	
	Examiner	Art Unit	
	Antonio A. Caschera	2676	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 July 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4-6 and 9-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4-6,9-15,17 and 18* is/are rejected.

7)☒ Claim(s) *16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 December 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. Receipt is acknowledged of a request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e) and a submission, filed on 07/29/2005.

Priority

2. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in the pending application.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 4-6, 9-11, 14, 15, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato (JP10-040395) in view of Matsugu et al. (U.S. Patent 6,453,069 B1).

In reference to claims 1 and 6, Kato discloses an object outline processing method where outlines of objects, including curved outlines, are extracted using curve data points of 2 reference frames to produce, the same curve data points in intermediate frames, onto a display (see paragraph 31, lines 14-18 of paragraph 30, "solution" section of abstract and Figure 6). Kato also discloses using certain curve data points of the outline of an object of reference frames F1

and Fn to create the object in intermediate frames so that certain curve data points, An and Nn, correspond in all the frames F1-Fn (see paragraphs 31-35 and Figures 5-7). Kato discloses the start reference frame F1 and end reference frame being Fn (see lines 4-6 of paragraph 31). Kato also discloses using a DDA algorithm to interpolate curve data points, based on those points of reference frames F1 and Fn, between data midpoints K1-Kn of an object in intermediate frame Fk (see paragraphs 35-36 and Figure 7). Kato does not explicitly disclose determining analogousness between a first image portion including a correspondence point identified in the first frame and a second image portion including the correspondence point in the second frame by determining an absolute value sum of differences of respective pixel values within the first image portion and second image portion. Matsugu et al. discloses an image processing method for precisely and automatically detecting a specific image extraction region from an input image (see lines 1-3 of abstract). Matsugu et al. also discloses region matching processing of areas within a standard model image and a target image whereby a contour line is extracted based upon the absolute sum differences of RGB pixel values in the respective regions (see column 26-27, lines.56-23). Matsugu et al. discloses an embodiment wherein an affine transformation matrix estimation unit estimates an affine transformation for globally and locally correcting translation components, rotation components, magnification variation components and the like between main and sub images (see column 39, lines 8-22 and #1019 of Figure 24). Matsugu et al. then discloses that the extraction of information of a subsequent frame is predicted by performing an affine transformation of at least points on the contour of an extraction region of a current frame using the above mentioned estimation (see column 39, lines 42-46). Note, the office interprets the region matching processing of Matsugu et al. to perform equivalent processing as the,

determining of analogousness of first and second image portions based upon absolute sum differences of applicant's claims. It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the region matching processing of Matsugu et al. with the object outline processing techniques of Kato in order to provide a more accurate frame-by-frame outline detection scheme by stably, automatically and economically recognizing objects without being influenced by differences of the image size and/or position (see column 3, lines 10-15 of Matsugu et al.).

In reference to claims 4 and 5, Kato and Matsugu et al. disclose all of the claim limitations as applied to claim 1 above, in addition, Kato discloses using certain curve data points of the outline of an object of reference frames F1 and Fn to create an object in intermediate frames so that certain curve data points, An and Nn, correspond in all the frames F1-Fn (see paragraphs 31-35 and Figures 5-7).

In reference to claims 9 and 10, Kato and Matsugu et al. disclose all of the claim limitations as applied to claim 6 above, in addition, Kato discloses using certain curve data points of the outline of an object of reference frames F1 and Fn to create an object in intermediate frames so that certain curve data points, An and Nn, correspond in all the frames F1-Fn (see paragraphs 31-35 and Figures 5-7).

In reference to claim 11, Kato discloses an auxiliary memory which stores various programs defining the data processing method (see paragraph 17 and #308 of Figure 1). Kato also discloses an object outline processing method where outlines of objects, including curved outlines, are extracted using curve data points of 2 reference frames to produce, the same curve data points in intermediate frames, onto a display (see paragraph 31, lines 14-18 of paragraph 30,

"solution" section of abstract and Figure 6). Kato discloses using certain curve data points of the outline of an object of reference frames F1 and Fn to create the object in intermediate frames so that certain curve data points, An and Nn, correspond in all the frames F1-Fn (see paragraphs 31-35 and Figures 5-7). Kato does not explicitly disclose determining analogousness between a first image portion including a correspondence point identified in the first frame and a second image portion including the correspondence point in the second frame by determining an absolute value sum of differences of respective pixel values within the first image portion and second image portion. Matsugu et al. discloses an image processing method for precisely and automatically detecting a specific image extraction region from an input image (see lines 1-3 of abstract). Matsugu et al. also discloses region matching processing of areas within a standard model image and a target image whereby a contour line is extracted based upon the absolute sum differences of RGB pixel values in the respective regions (see column 26-27, lines.56-23). Note, the office interprets the region matching processing of Matsugu et al. to perform equivalent processing as the, determining of analogousness of first and second image portions based upon absolute sum differences of applicant's claims. It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the region matching processing of Matsugu et al. with the object outline processing techniques of Kato in order to provide a more accurate frame-by-frame outline detection scheme by stably, automatically and economically recognizing objects without being influenced by differences of the image size and/or position (see column 3, lines 10-15 of Matsugu et al.).

In reference to claim 14, Kato and Matsugu et al. disclose all of the claim limitations as applied to claim 1 above. Kato also discloses using a DDA algorithm to interpolate curve data

points, based on those points of reference frames F1 and Fn, between data midpoints K1-Kn of an object in intermediate frame Fk (see paragraphs 35-36 and Figure 7). Note, since the points used in interpolating in Kato represent pixel values and these values being commonly associated with color values, the office interprets that Kato therefore inherently discloses interpolation using a color axis of the DDA'ed curve.

In reference to claim 15, Kato and Matsugu et al. disclose all of the claim limitations as applied to claim 1 above. Kato also discloses using a DDA algorithm to interpolate curve data points, based on those points of reference frames F1 and Fn, between data midpoints K1-Kn of an object in intermediate frame Fk (see paragraphs 35-36 and Figure 7). Note, the office interprets the DDA algorithm of Kato functionally equivalent to the path search method of Applicant's claim.

In reference to claims 17 and 18, Kato and Matsugu et al. disclose all of the claim limitations as applied to claim 1 above. Although neither Kato nor Matsugu et al. explicitly disclose performing linear interpolation using Bezier curves or B-splines, at the time the invention was made, it would have been obvious to one of ordinary skill in the art to generate the curves using the above methods. Applicant has not disclosed that specifically using Bezier curves or B-splines provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with DDA interpolation techniques of Kato because the exact method of producing the interpolated curve is seen as a matter of design choice as preferred by the inventor and to which best suits the application at hand. Therefore, it would have been

obvious to one of ordinary skill in this art to modify Kato and Matsugu et al. to obtain the invention as specified in claims 17 and 18.

4. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato (JP10-040395), Matsugu et al. (U.S. Patent 6,453,069 B1) and further in view of Ito et al. (U.S. Patent 5,966,141).

In reference to claims 12 and 13, Kato and Matsugu et al. disclose all of the claim limitations as applied to claims 1 and 6 respectively above. Although Kato discloses using certain curve data points of the outline of an object of reference frames F1 and Fn to create the object in intermediate frames so that certain curve data points, An and Nn, correspond in all the frames F1-Fn (see paragraphs 31-35 and Figures 5-7), neither Kato nor Matsugu et al. explicitly disclose determining a length of a round portion of the curve in the first frame and a length of a round portion of the curve in the third frame. Ito et al. discloses a system and method creating an animation of shapes whereby the contours of shapes are matched and corresponded to each other between different frames (see lines 1-4 of abstract). Ito et al. also discloses the system comprising a corresponding contour detector that determines corresponding contour pairs in adjacent key frames (see column 31, lines 48-50). Ito et al. discloses the key frames to be frames comprising a topological change to an object (see column 5, lines 38-40). Ito et al. discloses the contour detector calculating arc lengths of upper and lower contours of an object in each key frame, F0 and F1 (see column 32, lines 55-58 and column 33, lines 34-36). Ito et al. further discloses determining other paired points using interpolation, defined by the function U(x), between the endpoints of the arc lengths (see column 33, lines 48-53 and #x0, x1 of Figure 38). Note, the office interprets the corresponding contour detection methods of Ito et al. to inherently

disclose calculating a, "sampling interval" when performing interpolation as the interpolation function performs sampling within a certain range of points. It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the contour correspondence determining techniques of Ito et al. with the region matching processing and the object outline processing techniques of Kato and Matsugu et al. in order to provide correctly shaped objects for automatically created intermediate frames generating these frames using relatively easy hardware and simple user operation (see column 2, lines 41-47 of Ito et al.).

Allowable Subject Matter

5. Claim 16 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In reference to claim 16, the prior art of record (Kato (JP10-040395), Matsugu et al. (U.S. Patent 6,453,069 B1) and Ito et al. (U.S. Patent 5,966,141)) does not explicitly disclose the path search method extracting a path that passes close to a portion of the curve having a higher gradient strength, in combination with the further limitations of claim 15, of which claim 16 is dependent upon.

Response to Arguments

6. The cancellation of claims 3 and 8 (the limitations from these claims added to independent claims 1 and 6) and addition of claims 14-18 are noted.

7. Applicant's arguments with respect to claims 1, 4-6 and 9-13 have been considered but are moot in view of the new ground(s) of rejection.

References Cited

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

a. Lee et al. (U.S. Patent 5,970,173)

- Lee et al. discloses a transformation method which provides a multi-dimensional affine transformation for representing motion between corresponding image components of successive video image frames.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Antonio Caschera whose telephone number is (571) 272-7781. The examiner can normally be reached Monday-Thursday and alternate Fridays between 7:30 AM and 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella, can be reached at (571) 272-7778.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

571-273-8300 (Central Fax)

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

aac

8/16/05

MATTHEW C. BELLA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600